

CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 20 (canceled)

Claim 21 (new): A metal pipe comprising a bent metal plate having

parallel first and second edge sections in opposed and engaged position; and

a male portion and a female portion respectively formed on said first and second edge sections, said male and female portions engaging each other and being locked together in a caulked portion formed by caulking with deformation of at least one of said male and female portions;

wherein at least one space is located between and laterally of said male and female portions locked in said caulked portion.

Claim 22 (new): A metal pipe according to claim 21, wherein said metal pipe has a rectangular shape in section having four flat surfaces and four corners, and said caulked portion is formed on one of said four flat surfaces.

Claim 23 (new): A metal pipe according to claim 22, wherein said metal pipe has a first flat surface on which said caulked portion is formed, a second flat surface perpendicular to said first flat surface at a first corner, a third flat surface perpendicular to said second flat surface at a second corner and opposite to said first flat surface and a fourth flat surface perpendicular to said third flat surface at a third corner and to said first flat surface at a fourth corner and opposite to said second flat surface.

Claim 24 (new): A metal pipe according to claim 23, wherein one of said four flat surfaces has established therein a spring back force acting in a direction for urging said first and second edge sections to approach each other.

Claim 25 (new): A metal pipe according to claim 24, wherein said third flat surface has said spring back force established therein by applying an external force on said first and second side surfaces to cause said third flat surface to project outwardly and then deforming the third flat surface into a flat condition by applying an external force thereto.

Claim 26 (new): A metal pipe according to claim 25, wherein said third flat surface is caused to project inwardly.

Claim 27 (new): A metal pipe according to claim 24, wherein said third flat surface has said spring back force established therein by stopping deformation of the third flat surface which tends to project outwardly when an external force is applied on the second and fourth flat surfaces and holding said third flat surface in a flat condition.

Claim 28 (new): A metal pipe according to claim 21, wherein a plurality of male portions are formed on said first edge section and a plurality of female portions are formed on said second edge section, and wherein the male portions are respectively inserted into the female portions to engage them.

Claim 29 (new): A metal pipe comprising a bent metal plate having

parallel first and second edge sections in opposed and engaged position;

a male portion formed on said first edge section and having a pair of divided pieces; and

a female portion formed on said second edge section and having a space with a back portion and broadened toward the back portion from an open end of said space, a projection projecting toward said open end from the center of the back portion, and a pair of engaging walls formed on said open end;

wherein said pair of divided pieces are inserted in said space through said open end and are deformed in a mutually spaced direction by insertion of said projection between said divided pieces, with clearances between said divided pieces and said projection and with said pair of engaging walls engaging said pair of divided pieces.

Claim 30 (new): A metal pipe according to claim 29, wherein convex engagement sections projecting from said second edge section are provided on said pair of engaging walls, and concave engagement sections opposing said convex engagement sections are provided on said male portion, and wherein said pair of engaging walls are deformed to pinch said pair of divided pieces from both sides thereof due to engagement of said concave and convex engagement sections.

Claim 31 (new): A metal pipe according to claim 30, wherein the contour of said projection has a mountain shape and mutually opposed sides of said pair of divided pieces have a shape corresponding to the contour of said projection.

Claim 32 (new): A metal pipe according to claim 30, wherein sloped sides are provided on said convex engagement sections and sloped sides corresponding to said sloped sides of said convex engagement sections are provided on said concave engagement

sections in order to deform said pair of engaging walls in a direction of narrowing open ends of said pair of engaging walls.

Claim 33 (new): A metal pipe comprising a bent metal plate having

parallel first and second edge sections in opposed and engaged position;

a male portion formed on said first edge section and having male engagement sections, concave engagement sections being provided on said male portion; and

a female portion formed on said second edge section and having a space with a back portion and broadened toward the back portion from an open end of said space, and a pair of engaging walls formed on said open end, convex engagement sections projecting from said second edge section and opposing to said concave engagement sections being provided on said pair of engaging walls;

wherein said male engagement sections are inserted in said space through said open end and are engaged by said pair of engaging walls and are deformed, with clearances between said male engagement sections and said female portion, said pair of engaging walls being deformed to pinch said male engagement sections from both sides thereof by engagement of said concave and convex engagement sections.

Claim 34 (new): A metal pipe according to claim 33, wherein sloped sides are provided on said convex engagement sections and sloped sides corresponding to said sloped sides of said convex engagement sections are provided on said concave engagement sections in order to deform said pair of engaging walls in a direction of narrowing open ends of said pair of engaging walls.

Claim 35 (new): A metal pipe comprising a bent metal plate having

parallel first and second edge sections in opposed and engaged position;

a male portion formed on said first edge section; and

a female portion formed on said second edge section;

wherein said male and female portions are engaged to caulk them while maintaining a partial lateral clearance between said male and female portions.

Claim 36 (new): A metal pipe comprising a bent metal plate having

parallel first and second edge sections in opposed and engaged position;

a male portion formed on said first edge section and having a pair of divided pieces; and

a female portion formed on said second edge section and having a space with a back portion and an open end into which said pair of divided pieces are inserted with deformation of the divided pieces, and a pair of engaging walls formed on said open end and engaging said pair of divided pieces subjected to deformation;

wherein said first and second edge sections are engaged in a condition that said divided pieces are engaged with said engaging walls when said pair of divided pieces are inserted into said space.

Claim 37 (new): A metal pipe produced by a method including bending a metal plate having first and second edge sections parallel to each other and opposing said first and second edge sections, said method comprising:

a first processing step for forming a male portion on said first edge section and a female portion on said second edge section, said male and female portions being shaped and disposed to be locked when said first and second edge sections are in a final engaged position;

a second processing step for forming a processed article in which said first and second sections are opposed by bending said metal plate; and

a third processing step for forming a caulked portion for locking said male and female portions in said final engaged position by deforming at least one of said male and female portions with said male and female portions engaging each other while generating at least one space located between and laterally of said male and female portions when said male and female portions are locked in said caulked portion.

Claim 38 (new): A metal pipe produced by a method including bending a metal plate having mutually parallel first and second edge sections and opposing said first and second edge sections, said method comprising:

a step for forming on said first edge section a male portion having a pair of divided pieces to be subjected to deformation and for forming on said second edge section a female portion having a space with a back portion and broadened toward the back portion from an open end of said space for inserting said pair of divided pieces, a projection projecting toward said open end from the center of the back portion for deforming said pair of divided pieces in a mutually spaced direction by said projection being inserted between said divided pieces, and a pair of engaging walls formed on said open end for engaging said pair of divided pieces when the divided pieces are subjected to deformation;

a step for disposing said first and second edge sections in an opposed relation to each other by bending said metal plate; and

a step for engaging said first and second edge sections with clearances, between said pair of divided pieces and projection by deforming said divided pieces with said projection when said pair of divided pieces are inserted into said space upon bending of said metal plate.

Claim 39 (new): A metal pipe produced by a method including bending a metal plate having mutually parallel first and second edge sections and opposing said first and second edge sections, said method comprising:

a step for forming on said first edge section a male portion having male engagement sections to be subjected to deformation and for forming on said second edge section a female portion having a space with a back portion and broadened toward the back portion from an open end of said space for inserting said male engagement sections, and a pair of engaging walls formed on said open end for engaging said male engagement sections;

a step for disposing said first and second edge sections in an opposed relation to each other by bending said metal plate; and

a step for engaging said first and second edge sections with clearances between said male engagement sections and female portion when said male engagement sections are inserted into said space, convex engagement sections projecting from said second edge section being pre-provided on said pair of engaging walls, and concave engagement sections opposing to said convex engagement sections being pre-provided on said male portion, said pair of engaging walls being deformed to pinch said male engagement sections from the both sides thereof by engagement of said concave and convex engagement sections.

Claim 40 (new): A metal pipe produced by a method including bending a metal plate having mutually parallel first and second edge sections and opposing mutually said first and second edge sections, said method comprising:

a first processing step for forming a male portion on said first edge section and a female portion on said second edge section;

a second processing step for bending said metal plate to oppose mutually said first and second edge sections; and

a third processing step for engaging said male and female portions to caulk them while maintaining a partial lateral clearance between said male and female portions.

Claim 41 (new): A metal pipe produced by a method including bending a metal plate having mutually parallel first and second edge sections and opposing said first and second edge sections, said method comprising:

a step for forming on said first edge section a male portion having a pair of divided pieces to be subjected to deformation and for forming on said second edge section a female portion having a space with a back portion and an open end for inserting said pair of divided pieces, and a pair of engaging walls formed on said open end for engaging said pair of divided pieces when the divided pieces are subjected to deformation;

a step for disposing said first and second edge sections in opposed relation to each other by bending said metal plate; and

a step for engaging said first and second edge sections by deforming said divided pieces into engagement with said engaging walls when said pair of divided pieces are inserted into said space upon bending of said metal plate.